

## OCTOBER 2012:

We like Feedback. Remember – Global Warming is Irreversible!

Compiled by Bill Haaf, 4CP Board of Directors; [billhaaf@verizon.net](mailto:billhaaf@verizon.net)

**CONTENTS:** *Arctic Melts; Ducks Overheat; Ocean Temp Rising; Data Centers Inefficient; Delaware under H2O; CHP is what?; Japan Finds Energy off Shore; New Grid for Wind; Renewable Purer than Caesars wife; Fun Stuff & Quiz; Reply to Shale gas press release.*

► **Arctic Ice Loss – Continuing Tragedy:** John Vidal; The Guardian, Excerpts:

Sea ice in the Arctic shrank a dramatic 18% this year on the previous record set in 2007 to a record low according to the official US monitoring organisation the National Snow and Ice Data Centre (NSIDC) in Boulder, Colorado.

Scientists said the fall was unprecedented and the clearest signal yet of climate change.

**That difference between the previous record and this year's is larger than the**

**entire state of Texas.**



**-Now Ice Free Texas!**

"We are now in uncharted territory," said NSIDC director Mark Serreze. "While we've long known that as the planet warms up, changes would be seen first and be most pronounced in the Arctic, few of us were prepared for how rapidly the changes would actually occur."

Other leading ice scientists this week predicted the complete collapse of sea ice in the Arctic within four years. "The final collapse ... is now happening and will probably be complete by 2015/16," said Prof Peter Wadhams of Cambridge University.

**The Bad News:** By now many of us have seen pictures of lonely polar bears, seemingly stranded on a patch of ice surrounded by water. But there are wider threats that extend beyond the Arctic and into the rest of the world.

**1. More Extreme Weather: Unlike Vegas; Changes in** the Arctic has much bearing on what happens in Texas or Moscow or southern provinces of China. A study in 2012 in *Geophysical Research Letters* has drawn a convincing connection. Blowing around the periphery of the Arctic is the polar jet stream – a region of high speed wind that blows west to east, and helps drive wind circulation around much of the northern

hemisphere. The jet stream is powered by the temperature difference in fall and winter between the Arctic and the more temperate areas just to its south.

But as the Arctic ice has receded, the Arctic Ocean waters have absorbed more heat in late summer and early fall. In late fall and early winter, they've given that heat up, back into the atmosphere. That, in turn, has led to warmer Arctic autumns and winters, which has reduced the temperature difference that fuels the jet stream. The result is that the jet stream is now weaker than it once was.

A slower jet stream makes it easier for 'blocking' weather patterns to develop. Blocking weather patterns are the ones that hover over a region rather than moving on – like the drought that basted Texas in 2011 and decimated its forests and hay and wheat crops to the tune of more than \$7 billion in damage, and like the heat wave that enveloped Moscow and much of the rest of Russia for most of the summer of 2010.

**2. Accelerated Warming:** The second thing to fear about loss of Arctic sea ice is the potential to accelerate climate change on a *global* basis.

A black object gets hotter in the sun than a white object. Dark sea waters absorb up to 90% of the sun's energy that strikes them, while snow-covered ice absorbs only 10 to 20% of that same energy. The exposure of darker waters speeds up heating of the Arctic, and thus the loss of more ice.

In June, the Arctic ice cap covers around 2% of the Earth's surface. And that 2% of the Earth's surface, for a period of roughly two months, receives more solar energy per day than even the sunniest areas on the equator.

Peter Wadhams of the Global Oceans Physics Program at Cambridge calculates that the loss of the Arctic ice throughout the summer would have **an Additional warming effect roughly equivalent to all human activity to date.**

There are important caveats and uncertainties to that analysis. Wadhams doesn't take into account the effect of clouds. Darker waters absorb more energy from sunlight only if the sunlight reaches them.

**3. The Arctic Methane Bomb:** The final risk is the largest in the very long term, though the extent to which it will affect us in the coming years and decades is still a matter of great uncertainty.

The Arctic and the region immediately surrounding it are home to immense amounts of buried carbon. The permafrost of Siberia, Canada, and Alaska is estimated to hold around 1.7 trillion tons of carbon – mostly in the form of dead plant matter.

By contrast, all human CO<sub>2</sub> emissions over the last century amount to only 1.1 trillion tons of carbon. The permafrost carbon, alone, could exceed the effect of all human burning of fossil fuels. What's worse is that much of that carbon will end up released as methane (CH<sub>4</sub>) instead of carbon dioxide (CO<sub>2</sub>).

And the permafrost is melting. In Fairbanks, Alaska, ground that's been frozen solid for 10,000 years is melting, opening up sink holes. In the town of Newtok, Alaska, the permafrost melt has been so bad that the residents recently voted to move the entire town rather than stay and watch it sink into the once frozen land.



*Once frozen solid, permafrost near the Arctic is melting.*

Andrew Weaver, a climate scientist at the University of Victoria and one of the study's authors, warns that once the planet warms by more than two degrees C, the impact could be dire. "Warming much beyond that puts an unacceptably high probability that we're committed to Greenland melting," Weaver said in an interview. "Rather large percentages of existing species become committed to extinction."



**► Ducks Unlimited: Climate Change and Waterfowl**

<http://www.ducks.org/conservation/public-policy/climate-change>

Most major waterfowl habitats in North America face potentially significant, detrimental impacts from the effects of climate change. Historic waterfowl breeding grounds such as

the Prairie Pothole Region and Western Boreal Forest could experience significant landscape changes and face more variable weather and precipitation, which could result in diminished waterfowl breeding populations in these areas over the long term. Coastal marshes on wintering grounds such as the Gulf Coast and Chesapeake Bay could be inundated by rising sea levels, significantly reducing their capacity to support waterfowl. The Central Valley of California, a key wintering area for pintails and other Pacific Flyway waterfowl, could see changes in water availability that will also impact waterfowl habitat abundance.

DU relies on objective, independent, and expertly reviewed science to guide its policy and conservation actions. DU biologists and other staff continually monitor scientific literature and the research of academic, federal, and state research institutions to inform conservation decisions. This approach has led to effective conservation across this continent and recognition by partners, government agencies, and legislators that DU is a credible, balanced, science-based organization.

***After examining the best available science on the issue, DU's conservation staff has determined that climate change poses a significant threat to North America's waterfowl that could undermine achievements gained through more than 70 years of conservation work.*** As a result, DU's science staff is studying and planning for the potential impacts of climate change to ensure wetland and waterfowl management objectives are achieved and policy efforts that reduce the threat of climate change and enhance the resiliency and sustainability of wildlife and their habitats are implemented.

### **► Record Ocean Temperatures Recorded Off New England Coast**



Federal ocean scientists said this year's sea surface temperatures along the northeast coast of the U.S. set all-time records, with as-yet unknown consequences for marine ecosystems.

Above-average temperatures were found in all parts of the ecosystem, from the ocean bottom to the sea surface and across the region, and the above average temperatures extended beyond the shelf break front to the Gulf Stream, according to an ecosystem advisory issued by NOAA's Northeast Fisheries Science Center.

The warm waters led to the earliest, most intense and longest-lasting plankton bloom on record, with implications for marine life, from the smallest creatures to the largest marine mammals like whales. Atlantic cod continued to shift northeastward from its historic distribution center.

Friedland said the average sea surface temperature exceeded 51 degrees during the first half of 2012, topping the previous record high set in 1951. The average sea surface temperature the past three decades has ranged around 48 degrees.

Temperatures climbed even higher than that in some near-shore locations like Delaware Bay and Chesapeake Bay, where sea surface temperature readings were more than 6 degrees above historical average and more than 5 degrees above average at the seafloor.

► **Data Centers: Power, Pollution and the Internet: NY Times J. Glanz**

Stupendous amounts of data are set in motion each day as, with an innocuous click or tap, people download movies on iTunes, check credit card balances through Visa's Web site, send Yahoo e-mail with files attached, buy products on Amazon, post on Twitter or read newspapers online.

A yearlong examination by The New York Times has revealed that this foundation of the information industry is sharply at odds with its image of sleek efficiency and environmental friendliness.

***Most data centers, by design, consume vast amounts of energy in an incongruously wasteful manner, interviews and documents show. Online companies typically run their facilities at maximum capacity around the clock, whatever the demand. As a result, data centers can waste 90 percent or more of the electricity they pull off the grid, The Times found.*** For more on this fascinating article see: <http://www.nytimes.com/2012/09/23/technology/data-centers-waste-vast-amounts-of-energy-belying-industry-image.html?ref=jamesglanz>

► **Commercial Cellulosic Ethanol a Reality: Lynn Grooms in Farm Industry News Blog**

A commercial-scale cellulosic ethanol plant co-located with Lincolnway Energy's existing corn starch ethanol plant in Nevada, Iowa is planned for this fall. The new **DuPont Industrial Biosciences** facility will be capable of producing 28 million gallons of cellulosic ethanol per year and will require approximately 350,000 tons of biomass annually.

► **Offshore wind power generation in the spotlight in Japan:** T. FUJITA

As the government seeks to move away from nuclear energy, wind power in Japan has seen a surge in popularity, with a growing number of power utilities and heavy industrial manufacturers starting offshore turbine construction projects.

The Environment Ministry announced that it aims to increase Japan's offshore wind power generation to 8.03 million kilowatts, equal to the amount of electricity generated by eight nuclear power reactors, by 2030, and projects for new or expanded wind farms are already under way around the country.

Government initiatives have also spurred investment. Japan in July implemented a feed-in tariff system, under which power utilities must purchase electricity from applicable renewable energy resources at a fixed price, and the Environment Ministry is also considering setting the purchase price for offshore electricity higher than for land-based energy.

The remaining obstacle is reducing construction costs. Construction of a wind farm off the coast costs at least 1.5 times more than that of land-based wind farms.



► **Delaware Coastal studies to shore up action:**

Residents in Delaware Bay communities from Broadkill Beach north to Kitts Hummock are about to find out what the long-term plans are to save their part of the coastline from sea-level rise. Forecast not good

***A landmark DNREC study on Delaware's vulnerability to the rising sea level. The report found that 8 to 11 percent of the state's land area could be flooded by the end of the century under moderate forecasts for global sea-level rise. That would affect 3,000 to 17,000 homes as well as inundate 116 to 484 miles of roads and bridges.***

***DNREC's estimate was based on forecasts of a 1.6- to 5-foot rise in Mid-Atlantic coast sea-levels by 2100, a change that scientists have said will be driven by past and ongoing releases of heat-trapping carbon dioxide and other pollutants into the atmosphere.***

“Sea-level rise is not just a problem for beach-front homeowners,” said Sarah W. Cooksey, advisory committee chair and administrator of DNREC’s Delaware Coastal Programs. “It is an issue that will affect every Delawarean.”

► **Nuclear:** The *United Arab Emirates* (what – no oil?) has started to build its first nuclear reactor, making it the first country to embark on a commercial nuclear program since China in 1985. The reactor is the first of four that will be supplied by a South Korean consortium at a total cost of US\$20 billion. The 1,400-megawatt pressurized water reactor is scheduled to begin operations in 2017. Meanwhile China continues work on 52 nuclear reactors & two new “pebble” design reactors.

### ► **\$3.5 Billion Wind Power Line Approved for Oklahoma**



The Plains and Eastern Clean Line **wind power** transmission line in Oklahoma **was approved** by the Federal Energy Regulatory Commission Wednesday to start acquiring customers for its potential 7,000 MW of clean energy.

This line will be approximately 800 miles in length and is a **high-voltage direct current** transmission project. The new line is being developed in order to send clean energy generated by **wind farms** in western Oklahoma, southwest Kansas, and the Texas Panhandle to customers in the Mid-South and Southeast.

It has been estimated about **10,000 jobs** will be created as a result of the project being constructed. Additionally, 1,000 jobs will be generated for maintenance and operation of both the new power line and the wind farms connected to it.

► **KUDOS In River Turbines:** Deep in the heart of coal country in northeastern Kentucky and southern Ohio, residents soon will be able to draw electricity from a new hydroelectric plant. Located on the Ohio River in Bracken County, the \$550 million project will boast three large, 35-megawatt bulb turbines, similar in appearance to an underwater jet engine.

The 105-megawatt power plant will provide is expected to produce more than 520,000 megawatt-hours of **renewable electricity** every year for the surrounding area and the nearby city of Hamilton, Ohio.

Ohio and Kentucky both rely heavily on traditional fossil fuels, primarily coal. The U.S. EIA reports that in 2009, Kentucky drew 92.7 percent of its electricity from coal, while Ohio came in only modestly lower at 83.6 percent, making the new hydro plant a major change.

### ► **Why Do We Hold Renewable Energy to a Different Standard than Fossil Fuels & Nuclear Energy**

Now that renewable are receiving some of the same incentives that fossil fuels have enjoyed for nearly one hundred years, we're suddenly being inundated with calls for a purely "free-market" approach to energy development from politicians on the right and companies concerned about the growth of clean energy.

Their arguments make for good sound bites. But if we take a look at the history of energy development in the U.S., it's very clear that we've never had a truly "free" market. In fact, all of the technologies that dominate our energy system today were given special incentives by the government in order to get them to commercial scale.

According to the venture capital firm DBL Investors, the U.S. coal, oil, gas, and nuclear industries have cumulatively taken in more than \$630 billion in tax credits, land grants, R&D programs, and direct investments from the government. That far surpasses the roughly \$50 billion in government renewable energy investments (wind, solar PV, solar thermal, geothermal, biofuels) through these same mechanisms over the decades, according to the report.

But when renewable energy is given similar incentives — helping **double the penetration** of non-hydro renewable electricity since 2008 — the energy free-marketeers come out of hiding and lament how we're supposedly "picking winners and losers." The Republican party's platform released this week is a perfect example:

Unlike the current Administration, we will not pick winners and losers in the energy market-place. Instead, we will let the free market and the public's preferences determine the industry out-comes. In assessing the various sources of potential energy, Republicans advocate an all-of-the-above diversified approach, taking advantage of all our American God-given resources. That is the best way to advance North American energy independence.

Sounds pretty straightforward. However, the RNC's platform is very bullish on maintaining use of coal, a resource that is declining in the U.S. because of ... current market forces.

According to the EIA, we've seen a 20 percent drop in coal generation over the last year. That decline has been "primarily driven by the increasing relative cost advantages of natural gas over coal for power generation in some regions," wrote EIA.

But when market forces move in the wrong direction for coal supporters, that is apparently when it's okay for government to intervene. According to the RNC's platform, the party wants to use the strength of government to "encourage the increased safe development in all regions of the nation's coal resources."

***So there you have it. When the government encourages renewable energy, that's called picking winners and losers. But when the government encourages coal — that's "the best way to advance North American energy independence."***

And the picture becomes even more complicated when looking at the forces behind the boom in gas production. In fact, the fracking technologies people love to hold up as a miracle of the free market were made possible through years of government investment.

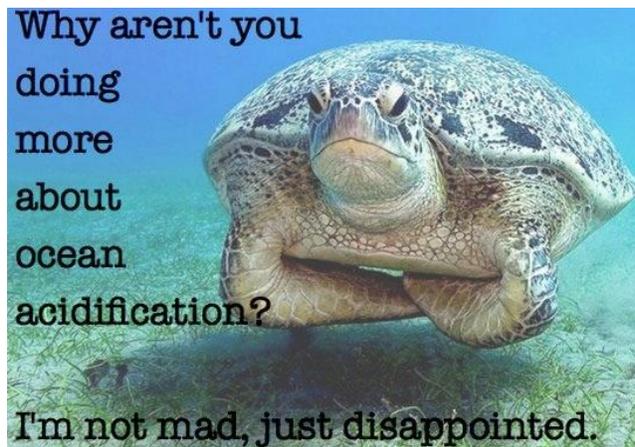
A 2011 investigation from the Breakthrough Institute showed that ***the natural gas industry was able to commercialize fracking technologies only after decades of tax credits, government R&D programs, government assistance with mapping, and partnership with companies entering commercial scale.***

A geologist from Mitchell Energy, a leading company that pioneered fracking put it this way: "I'm conservative as hell. But the "[Department of Energy] did a hell of a lot of work, and I can't give them enough credit for that."

And most people only know about the ones that are easy to track. There are other imbedded subsidies — things like **land give-aways to coal companies** or tax exemptions.

♥ **UPDATE ON 4CP ACTIONS:** We have had teams of 5-7 people visit with federal HR Congressman (Rep Pitts; Gerlach & Meehan) to spend time discussing the science of global warming & the large risks to our children and grandchildren. Good discussions. We have been invited to follow up. Let us know if you have an interest in joining this important effort. Thanks...

## ► **MISC FUN STUFF & QUIZ**



**QUIZ ??:** Last month was a 75 M wind turbine blade. Yes several winners of LED flash lts. October Question: What is this? ...Hint: Think Crimson .....?



⇒ **Did you see the Marcellus shale article in Phila. Inq ? Here is my reply & to the MS website contact.** *"The article by Kathryn Klaber is true to a point. So Kudos to the shale gas industry for improving our local economy. And Kudos for displacing coal and thus reducing Greenhouse gas emissions. However what was left out and is always left out is the strategy that the Shale gas industry has to further reduce their green house gas emissions. Because if America and the world is to avoid the big impacts from a hot planet; then just moving to nat gas is not sufficient. So Kathryn; what is your plan to dramatically reduce your GHG emissions? Or should America be moving to wind and solar and geothermal to displace the huge risks from burning more gas? "*

***Finally: We love to give our 25 minute PowerPoint presentation on the “Science of & Solutions to Global Warming” to any audience. (Ask your Lions, Rotary, etc.; or church, lunch time Learning’s, or Retirement group, etc.)***